

Module 7

Setting Standards: Developing Operational Controls

For every aspect your company determines to be significant, some action must be taken. Action may include either writing operational control procedures for activities or steps in a production process where the potential impact may be well controlled or making changes in processes in order to reduce the potential for impact. In writing operational controls, determine the environmental performance standard desired for that aspect, set targets for that performance and write procedures (operational controls) to ensure that the standard will be met. Your company may already have procedures in place. These should be reviewed to be sure they are consistent with EMS objectives. If you determine that procedural change should take place in order to improve control of, or to reduce the cost of, controlling the potential impact, the DfE approach emphasizes the need to evaluate alternatives before setting targets. Module 8 describes the process for evaluating alternatives and establishing targets. This module describes the process for setting standards, developing operational controls, and creating the organizational support for ensuring that those standards are met.

The following are some examples of the kind of activities that might be improved with operational controls¹:

- ▶ management/disposal of wastes,
- ▶ approval of new chemicals,
- ▶ storage & handling of raw materials and chemicals,
- ▶ wastewater treatment,

DfE Program

Experience has demonstrated the importance of written procedures and thorough employee preparation and involvement.

¹Adapted from “Environmental Management Systems: *An Implementation Guide for Small and Medium-Sized Organizations*”, see References.

- ▶ building and vehicle maintenance,
- ▶ operation of paint line,
- ▶ transport,
- ▶ operation and maintenance of equipment,
- ▶ management of contractors,
- ▶ marketing and advertising, and
- ▶ acquisition or construction of property and facilities.

The process of setting standards and ensuring their success has several steps. These include:

- 1) determining the possible causes for the potential for impact,
- 2) setting standards or objectives for the desired environmental performance,
- 3) drafting operational controls,
- 4) designating persons responsible for maintaining operational controls and for reviewing the success of the controls,
- 5) developing training for responsible persons,
- 6) establishing methods for monitoring and measurement of environmental performance,
- 7) taking corrective action when standards/objectives are not met, and
- 8) establishing a DfE environmental review for new processes and products.

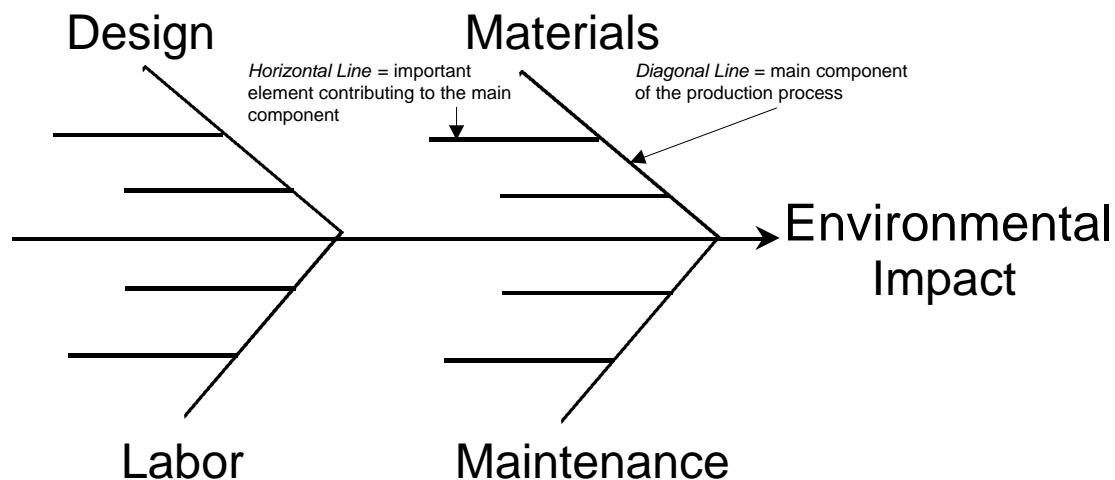
1. Determine the possible causes for potential impact

Review your list of significant aspects. For each one, list possible causes for the potential environmental impact. One way to determine causes is to conduct a “root cause” analysis.

The root cause diagram, shown below, will help you organize your thinking when you analyze your company’s potential for environmental impact. This analysis can be done by one person or by a group, with one person writing down the ideas produced. Each diagonal line represents a main component of the

production process. Your company may have different or additional components (for example, “disposal”) beyond those represented here. Each horizontal line stemming from the diagonal represents an important element contributing to each of the main components. For example, elements of work practices might contribute to the labor component. This diagram is simply a device to help organize the analysis of the cause of failure to meet targets. Use it if it helps, but don’t get hung up on trying to make it work.

Figure 11: Root Cause Diagram



The following are typical, but not necessarily obvious, causes of problems:

- ▶ poor communication,
- ▶ faulty or missing procedures,
- ▶ equipment malfunction (or lack of maintenance),
- ▶ lack of training,

- ▶ lack of understanding (of requirements), or
- ▶ failure to enforce rules.

Be sure that these possibilities have been considered in your environmental impact analysis.

2. Set standards or objectives for environmental performance

Write down an environmental performance standard for each significant aspect. Each standard expresses the environmental goal or objective you wish to meet for its corresponding significant aspect. Your objectives should be consistent with your company's environmental policy.

Worksheet 7-1: Significant Aspect Objectives		
Significant Aspect	Objective	Related Environmental Policy

3. Draft operational controls

Next, draft procedures for the standards you have developed for each significant aspect to ensure that the objectives for that aspect will be met. Review each of the causes identified in your root cause analysis that would contribute to the environmental impact of a significant aspect. Each of these causes should be addressed by drafting operational controls.

DfE Partner, Jeff Adrian of the John Roberts Company has provided operational control examples. See the Case Study at the end of this module.

In some cases operational controls may already exist for some of the activities associated with a significant aspect. Identify which aspects have written procedures that describe operational controls and which aspects will need to have procedures developed. In some cases the procedures that you have in place to comply with environmental and health and safety regulations may be useful to meet your DfE/EMS objectives. Generally, they may at least provide examples of how to write procedures. The worksheet below will help you track which aspects will require procedures and controls to be developed.

Worksheet 7-2					Procedures for Significant Aspects	
Aspect/Cause	Procedure needed (none exists)	Procedure exists, but is not documented	Procedure exists and is documented		No procedure needed	
			Adequate	Not Adequate		

It is important that the people who will implement the procedures be involved in drafting them. You can accomplish this in several ways:

- ▶ Have a meeting with the workers where they can describe current procedures. Discuss the environmental performance desired and how to write procedures to ensure that the objectives will be met.
- ▶ Have someone (possibly an intern) interview the workers to establish current procedures; then draft newly-written or revised procedures. Have the workers review the draft procedures.
- ▶ Have a manager draft the new or revised procedures. Be sure

that workers have a chance to review and comment on the draft procedures.

Keep the written procedures simple and concise. The procedures should include the appropriate actions, precautions, and notifications required. For the small business, it is also important to focus on activities that may lead to significant impacts and not get overwhelmed trying to control every activity and process.

4. Designate responsibility for maintaining and reviewing controls

In order to ensure that procedures are followed and deviations corrected, it is important to designate those people responsible both for maintaining the controls and for reviewing them. Generally, the workers responsible for the significant aspect under consideration will be responsible for implementing the procedures designed to meet the environmental objectives. The immediate line manager would most likely be responsible for regular review of the procedures and controls. It is helpful to list those people responsible for each set of procedures. The worksheet below will help with documenting responsibilities.

Worksheet 7-3: Operational Control Responsibilities			
Significant Aspect	Procedures	Responsible for maintaining controls	Responsible for review of controls

In addition to documenting who is responsible, it is also helpful to specify in the employee's performance standards the percent of time to be devoted to maintaining or reviewing controls. In addition, the performance standards could specify what

percentage of deviation from controls would result in unfavorable performance reviews.

5. Develop training for persons assigned responsibility

Achieving success in meeting environmental objectives for each significant aspect depends upon making sure that each person responsible for maintaining or reviewing controls and procedures has received adequate training. After procedures are drafted, develop a training program that ensures everyone understands both the procedures and their own role in ensuring that the procedures are followed. The worksheet below identifies some of the main decisions to be made when setting up a training plan. Integrate this training into any general training plan that your company might have or might have developed for your DfE/EMS. For example, the communication module in the Appendix contains information on developing a general training plan that would include 1) any existing training associated with occupational health and safety or environmental regulations, and 2) any new training designed to acquaint employees with the development of the DfE/EMS. Training in procedures and operational controls should be included in the broader company training plan.

Worksheet 7-4: Training Plan for Operational Controls								
Environmental Aspect	Procedures	Responsible Person	Training Needs	What Vehicle	When/Length	Budget	Completion Date	Person Responsible for training

Again, this worksheet is included in the Appendix Tool Kit. The purpose of this table is to help you identify, plan for and track the training needs of your employees with respect to ensuring that operational controls succeed in achieving your environmental performance objectives. Include this training with any general environmental training to create an integrated training plan for your DfE/EMS.

6. Establish methods for monitoring and measurement of environmental performance

Some say that “an EMS without an effective monitoring and measurement program is like driving at night without the headlights on – you know that you are moving but you can’t tell where you are going!”² To determine how well you are doing in meeting your goals, you need to decide how you will measure progress. Identify the key characteristics of the process you are working to improve. Your performance indicators should be:

- ▶ simple and understandable,
- ▶ objective,
- ▶ verifiable, and
- ▶ relevant to your goals and targets.

Below are some sample indicators of environmental performance. Each indicator that you choose should be related to the cause of potential impact by the aspect under consideration. The samples below are to illustrate a way to state your indicators.

- ▶ tons of SO₂ released per unit of electricity produced,
- ▶ pounds of hazardous substance “X” emitted per pound of product, and
- ▶ percentage reduction in the discharge of a material versus a base year.

It is important to measure “input” with respect to “output,” rather than by itself. Changes in input can be caused by reduced sales of the product as well as more efficient use of the input during the production process. To be sure you are measuring success rather than simply changes in sales volume, be sure to include

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Measurement and evaluation of environmental performance is an ongoing process.

²Environmental Management System: *An Implementation Guide for Small and Medium-Sized Organizations*, NSF International, Ann Arbor, Michigan, November 1996, p. 49.

output in your measurement criteria. Each measure should be an indicator of where problems may be occurring in the process. The worksheet below is designed to assist you in tracking your measurement indicators.

Worksheet 7-5: Environmental Performance Measurement Indicators						
Aspect	Objective	Indicator	Date Checked	Who Checked	Result	Corrective Action

It is also important that, when you measure your environmental performance, you maintain and calibrate any sensitive measurement equipment on a regular schedule. Again, designate a person to be responsible for this task, provide appropriate training on maintaining the measurement equipment, and document the schedule of checks and calibration.

7. Take corrective action for operational control failure

Action to correct failures in procedure should be taken as quickly as possible to meet environmental objectives. Assigned responsibilities for action and schedules should be clear. Employees in the shop may recognize the need for corrective action and provide good ideas for solving problems. Find ways to get them involved in the improvement process. It's important to determine whether a lapse is temporary or due to some flaw in the procedures or controls. For this reason, communicate any findings to the employees and provide any follow-up training for changes in the procedures that may result. The following is a checklist to help complete corrective action. Have you:

- ▶ Identified the problem(s)?

- ▶ Identified the cause(s)?
- ▶ Come up with a solution for each?
- ▶ Implemented the solution(s)?
- ▶ Documented the solution(s)?
- ▶ Communicated the solution(s)?
- ▶ Documented the action(s)?

Below is a sample Corrective Action Notice that will assist in documenting the resolution process.

Worksheet 7-6: Corrective Action Notice	
Issue Date:	Solution Due Date:
Requested by:	
Issued to:	
Problem Statement:	
Most Likely Causes:	
Suggested Solutions:	
Action Taken:	
Measured Results:	
Corrective Action Closed by:	Date:
<i>Contact for Notice:</i>	

In addition to the Corrective Action Notice, which helps to document and track specific actions, it is also helpful to track measurement, problems, and solutions. The sample log, below, will be useful in integrating the documentation and tracking of your environmental quality control system.

Worksheet 7-7: Measurement and Corrective Action Tracking Log		
Area and Step Measured:		Date:
Person Responsible	Means of Measurement	Results
Person Responsible	Problems Identified:	Solution Due:
Person Responsible	Solutions Identified:	Action Taken:
Person Responsible	Effectiveness Verified:	Date:
<i>Contact person for log:</i>		

8. Establish an Environmental Review for New Processes and Products

In addition to establishing operational controls for all significant aspects, it is important to set up a procedure for reviewing any changes in process or products. In most companies change is an important part of business survival. New products, new technologies, new ways of doing things are regular occurrences. In order to avoid creating new “significant environmental aspects” that must be addressed later, it is helpful to integrate new processes and products into the environmental management program that you are developing for the rest of your company. You can do so by setting up a procedure for reviewing new processes, products, or activities while they are in the planning stage. One way to accomplish this is to create a sign-off form to be circulated among the people responsible for or affected by the new process or product, including those responsible for the area of the company where the new process or activity will be carried out. Below is an example of such a sign-off form.

Worksheet 7-8: Environmental Review of New Processes and Activities				
Area of Company	New Process, Product, or Activity	Environmental Review by:	Environmental Effects:	Pollution Prevention Opportunities
	Manager/Date	Manager/Date		
<i>Contact for form:</i>				

The above worksheet is a model that should be modified to reflect your company's activities and environmental policy.

Case Study 2: The John Roberts Company

Jeff Adrian, Director of Environment & Safety, provided the following example of operating controls. He stated, "I am sending along by FAX some documents that I used to effectively change working procedures for cleaning printing presses with a low vapor pressure cleaning solvent. You can see that there was a 1) background sheet, telling the employees why this change was important; a 2) procedures sheet, that spelled out the new procedure and most importantly covered "critical points"; and finally, 3) two pages of Q&A addressing issues that had come up during preparation for this change. All the above to be sure employees know why the change is necessary and what part they are to play in making the change happen. When implementation day arrived, the change was made without any disruption and we have never looked back."

Case Study 2: The John Roberts Company

Example Of Preparation For Effectively Changing Work Practices

Three Components:

1. Backgrounder Sheet
2. How To Instructions with Critical Points
3. Questions & Answers

PRESS/BLANKET WASH - NEW PROCEDURES

Background

As some of you may already know, the elimination of Blanket Wash 2215 is necessitated by the tightening of environmental regulation.

Blanket Wash 2215 is a blend of solvents that includes the chemical 1,1,1 Trichlorethane (TCA), a chemical that has been banned internationally by the Montreal Protocol..

The reason for this is that TCA is an upper level ozone depleter, destroying the ozone layer that shields us from the harmful effects of the sun's ultraviolet radiation.

While still being manufactured today, TCA is being taxed at ever higher rates until it will no longer be manufactured in 1995.

Additionally, because Blanket Wash 2215 evaporates readily to the atmosphere, the other chemicals in the blend contribute volatile organic compounds (VOC's), which when combined with nitrogen oxides (from the burning of fossil fuels) and sunlight, leads to the formation of smog in the lower levels of our atmosphere.

The replacement for Blanket Wash 2215 will be the use of the much less volatile, and thus less harmful, Press Wash.

Because Press Wash solvent works at a different rate than the discontinued Blanket Wash 2215, a new cleaning procedure will have to be followed.

This new procedure, though somewhat different than today's method, will work nicely to clean press blankets. Here's how it works:

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PROCEDURE FOR CLEANING PRESS BLANKETS

Steps:

1. On the first turn of the cylinder, use a solvent saturated shop towel pad (as is the current practice) to loosen and remove most of the ink from the blanket's surface.
2. With a second shop towel pad that has been first dipped into water and then wrung out, remove the balance of the ink from the blanket's surface on the second turn of the cylinder.
3. Start the press as before.

Critical points:

1. By *not* using water on the first turn of the cylinder, the full strength of the Press Wash is available to move the ink. So, do not blend down Press Wash with water.
2. It is *not* necessary that the blanket be *absolutely* dry after the second turn of the cylinder. Rather, a slight film of water (think of how the sidewall of your car's tires look after just washing the car) will not be problem on startup of the press. The first few sheets will very easily carry this moisture off.
3. By using a second pass with a water wipe, clays, starch and paper dust are better removed. A water wipe should be easier to slide across the blanket than a drywipe.
4. *Care* does need to be taken in just one respect, and that is in the area of the blanket cylinder's grippers. Excess Press Wash or moisture there has the potential of being spun off the cylinder onto the stock if not removed.

Towel usage:

1. When the solvent shop towel pad is dirty, discard it in the safety cans as before.
2. The water wipe shop towel pad now becomes the solvent shop towel pad and a new pad (from clean shop towels) is made up for the water wipe step.

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QUESTIONS YOU MAY HAVE

Q. If we can still buy solvent blends that contain some 1,1,1 Trichloroethane (TCA), why do we need to make the change now?

A. Well, there are several reasons. First, there are some health concerns with TCA, so we want to eliminate any exposure as much as we possibly can. Second, in an effort to discourage the use of TCA now, the government is increasing taxes on this chemical (and other targeted chemicals), making the product unduly costly. Third, this is a reportable usage chemical, which requires that we complete Form R (a complicated procedure) that is also public information. It is better that we have no reportable chemical usage because if we do, then we are also brought into the regulatory loop on many other time consuming and costly programs. Fourth, John Roberts has made a commitment to *reduce* its total emissions as part of the Minnesota Toxic Pollution Prevention Plan and we will be accountable for reaching these goals. Fifth, as a responsible member of the community (in which many of us live as well as work), it is the right thing to do for the betterment of our environment.

Q. Will this new procedure slow down my work and reduce my productivity? Will I be penalized because of this?

A. Unquestionably, this new procedure will slow things down slightly, but not by much. Even with the older Blanket Wash, pressmen would often use two turns of the cylinder to complete the cleanup of the blanket. Understanding that the blanket does *not* need to be *completely dry* will save otherwise wasted time. So the only remaining time element is the need to switch to a water wipe shop towel pad and the time to take care to wipe the blanket ends, especially the cylinder gap. Management's commitment to environmental responsibility supports your efforts

Q. What if I find I need more shop towels? Won't this new procedure use a lot more shop towels?

A. If it turns out that you need more shop towels, they are available (we ordered extra last week and have them in stock). Testing that we have already done has shown that towel rotation (where the water wipe pad becomes the new solvent wipe pad and clean towels are then used for the new water wipe pad) works very well.

Q. Can I use a sponge instead of a shop towel pad for the second (water) wipe?

A. Yes, it's possible to use a sponge instead of a padded shop towel for the water wipe. But if you do choose to use a sponge, you will have to use less wiping pressure or you will squeeze the water out of the sponge onto the blanket leaving the blanket too wet. Try it and see if you like it. You may find a shop towel water wipe easier to control.

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Q. Can I mix water with the Press Wash and do it all at one time? Why might this not be a good procedure?

A. Yes, again it's possible to do this, but it's not recommended. Here's why. When you add water to Press Wash, you dilute the Press wash's ability to cut the ink in the first place. This may mean more work and slower cleaning. Also, Press Wash contains surfactants that make it able to mix with water, and it is these surfactants that tend to *remain* on the "clean" blanket that cause problems with both the ink roller train *and* the water fountain systems. It's good to remove surfactants as completely as possible, and this is best done with a separate water wipe.

Q. Can I just use a dry shop towel pad to wipe the blanket completely dry instead of a second water wipe? Would I be better off?

A. Well, for the reasons listed above, it's not recommended to use a dry shop towel second wipe. Aside from the fact that some feel a dry shop towel is harder to move across the blanket (it tends to drag), how would you clean the blanket of water solubles such as starches, clays and paper dust? The only reason I can think of to completely dry the blanket would be to ease your fear of "throwing" solvent drops on the work after startup. This is addressed by taking a little care on the second (water) wipe, especially at the ends of the blanket in the cylinder gap.